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ABSTRACT

The main purpose of the present study was to investigate whether persons' Holland personality types would affect preferences in the two occupational preference dimensions of interest and prestige. This study was based on the theoretical premises that persons: (1) tend to seek occupations that fit their interest type; and (2) consider prestige to be more important than interest in career compromising situations. An Occupational Preference Survey was constructed to investigate whether individuals would be more likely to consider prestige over interest-congruence when choosing occupations. Findings from 294 college students indicated significant Holland type differences among subjects' occupational preferences. Students generally preferred interest-congruent occupations. More specific findings revealed that among Anglo-American students, high-prestige/low-interest occupations were most preferred by Investigative type students and least preferred by Artistic and Social type students. (Contains 29 references; five tables present statistical analysis.) (Authors/TS)

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College Students' Holland Types and Their Occupational Preferences in a Forced-Choice Situation

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Authors' Notes

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COLLEGE STUDENTS' HOLLAND TYPES AND THEIR OCCUPATIONAL PREFERENCES IN A FORCED-CHOICE SITUATION

Among career theories of occupational choice, Holland (1973, 1985a) focused on interests as a primary determinant of occupational choice, and Gottfredson (1981) expanded the career choice process by exploring prestige as another powerful determinant of choice. Holland's concept of congruence embodies a view of the optimal matching of person and occupation as based on the person's knowledge of his or her vocational interests. Accordingly, people rely on their interest-based self-knowledge as a guide in forming their occupational preferences. To clarify his congruence concept, Holland (1973, 1985a) identified six main work personality types and their corresponding work environments: Realistic (R), Investigative (I), Artistic (A), Social (S), Enterprising (E), and Conventional (C). Congruence, or more specifically interest-based congruence, can be achieved when there is a match between a person's personality type and work environment (e.g., an E type person in an E type work environment).

On the other hand, Gottfredson (1981) has a developmental perspective of career preference in which relative importance are placed not only on the role of interest but also on the roles of prestige and gender-appropriateness. In her career compromise process, Gottfredson (1981) postulated that prestige is acknowledged as a more important occupational criterion than interest when people are able to distinguish different prestige levels of occupations. Occupational prestige, in this respect, is a relatively stable and consensually agreed upon characteristic of occupations that, like interest compatibility, is an important dimension of occupations (Chartrand, Dohm, Dawis, & Lofquist, 1987; Featherman & Hauser, 1976; Holt, 1989; Treas & Tyree, 1979). Therefore, when choosing

occupations, prestige level can serve as a critical consideration, particularly when it competes with interest level.

In both Holland's and Gottfredson's approaches to career choice, study findings were inconclusive in support of their respective theories. Research on Holland's congruence concept does not adequately explain the choice behavior of individuals who prefer occupations that do not match with their interest-congruence (Assouline & Meir; 1987, Smart, Elton, & McLaughlin, 1986; Spokane, 1985; Wiggins, Lederer, Salkowe, & Rys, 1983). Also, research based on Gottfredson's career compromise model found that people appear to place greater importance on prestige than gender-appropriateness when choosing occupations (Leung & Plake, 1990), and that interest was neither most readily nor most resistantly compromised when choosing occupations (Hesketh, Durant, & Pryor, 1990; Holt, 1989; Pryor & Taylor, 1986; Taylor & Pryor, 1985). Given these inconsistent results in people's compromising strategies, the next critical step would be to further identify characteristics or variables that affect people's occupational preferences in compromising situations.

Prior compromise studies have indicated gender to be one of the differentiating variables in career compromise. Male participants appeared to be place more importance than female participants on gender-appropriateness than prestige when choosing occupations (Leung & Harmon, 1990; Leung & Plake, 1990), and males were more likely to select prestige than interest than females on academic course choices (Taylor & Pryor, 1985). Another variable that received very limited attention is persons' Holland personality or interest types and how they impact their occupational preferences in compromising situations. The only study researched in this area suggested that, among Holland

types, engineering students (assumed as R type) tended to choose high-prestige opposite-type (S type) occupations over low-prestige R-type occupations. Contrastingly, social work students (assumed as S type) consistently chose S-type occupations over R-type occupations irrespective of prestige (Holt, 1989).

The purpose of this study is to further examine the impact of persons' Holland type when they are asked to compromise between occupations. Aside from gender, there appears to be some evidence that Holland type may determine persons' occupational preferences. The present study investigated whether persons' Holland type affects occupational preferences as a subsequent step to Holt's (1989) study. Rather than assuming subjects' Holland type based on their college major, this study investigated students' actual Holland type. Furthermore, given that gender appeared to be one of the identifying variables that differs in compromised situations, this study controlled for gender and other significant demographic variables to explain the relevance of Holland type on occupational preference. In doing so, concepts of Holland's congruence and Gottfredson's compromise may be better conceptualized to accommodate the complexity of individual's career choice.

The relations among specific Holland types and the two occupational preference dimensions of prestige and interest were examined in this study. Among the six Holland types, certain types may place more importance on prestige rather than interest on the basis of their work personalities as characterized by Holland (1973, 1985a). For example, the persons with Enterprising (E) type has been described as being ambitious and interested in business-related areas such that this type may prefer occupations that encompass high

prestige yet are not E type occupations. *S* type persons, on the other hand, have been characterized as being empathetic and interested in helping-related activities to which preferring occupations mainly on the basis of prestige may be unimportant to them. Similarly, Artistic (A) type persons may not consider prestige to be important because of their spontaneous and creative characteristics who are interested in self-expressive activities.

A forced-choice situation was created by administering a constructed paper-and-pencil measure of occupational preferences (Occupational Preference Survey [OPS]) that systematically varied the prestige and interest-congruence levels of occupational choices. In this study, the Holland type served as the subjects' own knowledge of their occupational interests. The main research question was: Does persons' primary Holland type predict the relative importance that is placed on prestige versus interest-congruence when forming their occupational preferences?

Three hypotheses were investigated in this study. The first two are preliminary hypotheses to confirm theoretical concepts of occupational preference. The first hypothesis is based on Holland's congruence concept in that, when only interest is considered between occupational pairs, subjects will prefer occupations that are matched with their primary Holland type. The second hypothesis relates to the importance of occupational prestige in that, when only prestige is considered between occupational pairs, subjects will likely prefer higher prestige occupations over lower prestige occupations. The main hypothesis of this study will predict that there will be significant Holland type differences when preferring occupations that vary in interest and prestige.

Method

Participants and Procedure

An initial sample of undergraduate university students (N = 413) enrolled in introductory psychology classes was administered a set of paper-and-pencil measures. Although participation in the study was voluntary, students were given two course credits for the completion of the measures. Prior to test administration, the investigator described the purpose of the study as an exploration of people's career interests and preferences. Aside from the demographic questionnaire, the order of OPS (Occupational Preference Survey), and Self-Directed Search (SDS: Holland, 1985b) was counterbalanced. The SDS was used to identify each subject's primary Holland type.

Selection of Final Participants

In order to be selected for the final sample, respondents had to meet three additional criteria. First, each respondent's score difference between his or her primary and secondary Holland types needed to be greater than or equal to four points. A "rule of 8" was suggested by Holland (1985a) in an attempt to clearly distinguish a person's primary personality type from his or her other types. However, in consideration of the possibility that a large number of respondents from the sample may be dropped due to this rule, a "rule of 4" was employed as a less conservative restriction. Furthermore, as a second consideration, subjects were excluded if their second or third code-type was opposite from their primary code-type (e.g., SRA, ICE). Following this selection process, the sample size was decreased from 413 to 316 respondents.

The third consideration involved the Holland personality types themselves. Previous research (Holland, 1985a; Spokane, 1985)

indicated that, among the traditional college age population, R and C type persons are uncommon, and are therefore not well represented in this population. In consideration of this issue, as well as the overall difficulty in having sufficient sample sizes for all six personality types, only the four most commonly identified personality types were included for the study.

Given these considerations, the final respondent sample was composed of 294 (197 females, 97 males) respondents with the age range of 17 to 23 (M= 19.12, SD= 1.28). The ethnicity of subjects included 227 Anglo-Americans, 26 African-Americans, 17 Asian-Americans, 13 Native-Americans, and 4 Others (3 biracial and 1 Asian-Indian). The four most-identified personality types were Social (n= 163), Enterprising (n= 50), Artistic (n= 44), and Investigative (n= 37) types in this study.

Measures

Construction of Occupational Preference Survey (OPS).

The OPS comprised of occupational pairs that contrasted Holland work-environment type and prestige. It was of forced-choice format such that respondents were asked to select one occupation over the other within the given pair.

The following steps were taken to construct the OPS:

1. A pool of occupational titles that differed in prestige levels (high, low) was selected from the Total Socioeconomic Index (TSEI: Stevens & Cho, 1985). The TSEI was based on the 1980 Census data and was derived from income and educational levels of approximately 890 occupational titles. The TSEI was selected for this study because it: (a) was used in prior career compromise studies (Leung & Plake, 1990), and (b) had demonstrated high correlations with other major indexes of

occupational prestige (Stevens & Featherman, 1981; Stevens & Hoisington, 1987). From a TSEI score range of 13.98 to 90.45, each occupational title has a score that represents a combined regression score of prestige rankings (i.e., ratings of occupational criteria such as worth and power) and averaged rankings of occupations' education and income levels.

2. After a pool of occupations was selected from TSEI, Holland work environments (Realistic[R], Investigative[I], Artistic[A], Social[S], Enterprising[E], and Conventional[C]) were then differentiated according to the Occupations Finder (Holland, 1985d). This classification booklet listed a representative sample of 12,099 possible occupations in Holland's "three-letter" code types. In order to test the hypotheses, the present study required a clear contrast of work environment types between pairs of occupations. Therefore, those occupations that had "opposite" or least compatible code-types in their three-letter codes were not included in the occupation pool. For example, occupations whose three-letter codes had two codes that were most distant (i.e., RSE, ISE, ECA, etc.), were excluded from the selection process. Subjects' education level was also considered in relation to the occupation pool. Since they were college students, even the low prestige occupations required minimal college education.

3. The above selection process produced a revised pool of occupational titles representing two prestige levels (high, low) and each of the six Holland primary code types (RIASEC). Occupations were then paired based on two selection processes: (a) Occupations within each pair represented "opposite" Holland types and (b) one occupation within each pair has higher prestige than the other. The first process was achieved by pairing the most distant Holland types

together. Following Holland's (1985a, 1985c) hexagonal model in examining the distance among the six types, R and S, I and E, and A and C types were paired together. The second process involved differentiating between high and low prestige levels within each pair. Based on the TSEI scores, a stratified random selection was needed for these pairings to insure that there was a higher and lower prestige level difference within each pair.

4. The completed product after both processes yielded a set of occupational pairs that systematically varied in Holland work-environment types and prestige levels. The TSEI score ranges of low and high prestige levels for each Holland work environment type are present in Table 1. Although the prestige distinctions were not obviously differentiated, especially between high and low prestige ranges for A and E types, the TSEI prestige score difference within each pair ranged from 12.62 to 56.30 (m= 36.47).

Insert Table 1 about here

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5. As a preliminary test of the measure's content validity, five raters (three counseling psychologists, two counseling psychology doctoral students) who were familiar with Holland types were asked to: (a) identify each occupation's Holland work environment code-type and (b) indicate the higher prestige occupation within each pair. Those occupations whose Holland type and prestige level were correctly identified by four out of five judges (80% agreement criteria) were included in the final item pool. The reduced OPS consisted of 60 pairs of occupations which contained six sets of 10 occupation pairs, resulting in six subscales. Each subscale represented opposite

Holland types with high and low prestige levels (e.g., "high-prestige/I-type vs. low-prestige/E-type" pair, "high-prestige/S-type vs. low-prestige/R-type" pair). A sample of the forced-choice format, or more specifically, the systematically-differentiated occupational preference format, of OPS is summarized in Table 2.

Insert Table 2 about here

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6. A pilot study was performed on the OPS to confirm that prestige differences within each occupational pair were indeed perceived. A small group of college students (N= 27) enrolled in a interpersonal communications class were asked to indicate the "higher prestige" occupation within each of 60 pairs. When tabulating the frequency of each occupational pair, it was observed that seven pairs received poor interrater agreement on identifying the correct prestige level. To address this, these occupational titles were slightly adjusted (e.g., from "biological technician" to "biological technician/worker"), with the assistance of four content experts (comprised of three counseling psychologists and a pre-doctoral intern with expertise in career psychology). This procedure was taken in an attempt to better differentiate the face validity of prestige levels and to preserve these occupations' actual definitions.

7. In addition to content expert and face validity performed on OPS, further reliability and validity information was gathered from two separate subject samples. Test-retest, with between-time span of five weeks, on a small group of young adults (N= 10) resulted in a moderate-high range of .65 to .90 (m= .81). Cronbach Alpha (α) coefficients were computed on the main study sample (N= 294) to

determine the internal consistency levels of the six subscales. The α's ranged from .64 to .85., suggesting moderate to high consistency rates within each occupational pair set.

Self Directed Search (SDS).

The Self-Directed Search (SDS: Holland, 1985b) inventory was chosen to identify respondents' primary Holland personality type. SDS items are organized into four response categories: Activities, Competencies, Occupations, and Self-Estimates, each category representing R, I, A, S, E, and C types. From these four categories, the scores are totaled based on each of the six Holland personality types. The highest total score was designated as subject's "primary" personality or interest type.

The SDS has been extensively researched for its comprehensiveness in measuring persons' career-related interests and perceived competencies (Holland, 1985c). Among males and females in the age range of 19 to 25 years, the correlated split-half reliability coefficients for the SDS Summary scales (which include the subscales of Activities, Competencies and Occupations, and Self-Estimates) ranged from .86 to .91. In the same age group of 19 to 25, the concurrent validity based on "% hits" (the percentage agreement from subjects between their primary SDS code-type and first-letter type of their current vocational aspiration) indicated relatively moderate-high rates of 59.0% and 61.9% hits for males and females, respectively (Holland, 1985c).

Variables

In this study, respondents' primary Holland type was the independent variable under investigation. From the 60 occupational pairs of OPS, three dependent measures were computed: (a) an 'interest congruence'

preference score range of 0 to 20 (i.e., number of times respondents preferred occupations that "matched" their Holland types relative to occupations that were "opposite" to their Holland types) to test for respondents' preference of interest-congruent occupations (first hypothesis); an 'overall prestige' preference score range of 0 to 60 (i.e., number of times respondents preferred high prestige occupations over low prestige occupations irrespective of Holland types) to test for respondents' preference of higher-prestige occupations (second hypothesis); and a 'prestige over interest' score of 0 to 10 (i.e., number of times respondents preferred high-prestige/low-interest occupations over low prestige/high interest occupations) to test for respondents' preference of occupations with higher-prestige/lower-interest (main hypothesis).

Results

In the 'interest congruence' preference measure, the overall mean of 16.43 out of 20 points possible suggested relatively high consistency rate (82%) for preferring congruent over incongruent occupations. In the 'overall prestige' measure, irrespective of their interest types, respondents selected 57% (m= 34.48) of the higher prestige occupations that were paired with lower prestige occupations. For the 'prestige over interest' preference measure in which the prestige and interest levels were systematically varied, a mean of 2.28 indicated a relatively low frequency rate among the respondents in their preference for high-prestige/low-interest occupations when compared with low-prestige/high-interest occupations.

Among the demographic variables, strong correlations ($p < .001$) were found among gender and the three dependent measures, and race (White vs. Non-White) and 'prestige over interest' measure.

Therefore, gender was included in all the analyses, and race, as a dichotomous variable, was included in the main analyses. To test for the preliminary hypotheses, separate ANOVAs were conducted to investigate the effects of gender and Holland type on the 'interest congruence' and 'overall prestige' measures. For the main hypothesis, two separate yet paralleled analyses of regression and nonparametric tests were used to test the extent to which Holland type predicted preferences of occupational pairs that systematically varied in prestige and interest-congruence.

Contrary to the first preliminary hypothesis, there were significant between group differences for Holland type ($F= 14.86$, $p< .001$) and gender ($F= 16.90$, $p< .001$) on the 'interest congruence' preference score. The main effect for gender and race indicated that females scored significantly higher than males in their preference for interest-congruent occupations. Scheffe post-hoc tests for Holland types revealed significant pair-wise Holland type differences between I and A, I and S, and E and A types. These results indicated that A ($m= 18.18$) type respondents preferred occupations that were congruent, or matched their personality type, significantly more than either I ($m= 14.46$) or E ($m= 15.16$) type respondents. I type respondents, by contrast, preferred occupations that matched their Holland type significantly less than either A or S ($m= 16.80$) type respondents.

For the second preliminary hypothesis, there were significant group differences for gender ($F= 14.16$, $p< .001$) and Holland type ($F= 2.84$, $p< .05$) on the 'overall prestige' preference score. Females preferred less number of higher prestige occupations than males. Scheffe post-hoc tests indicated a significant group difference between I and A types, with I type respondents ($m= 36.35$) scoring

significantly higher than A type respondents (m= 33.14) in their preference for high-prestige occupations. Neither S (m= 34.52) nor E (m= 34.18) types showed significant mean score differences relative to each other or to the other types.

For the main hypothesis, a hierarchical regression analysis was first conducted on 'prestige over interest' preference scores. The regression was used (a) to control for gender and race and (b) to confirm the findings by computing a set of nonparametric tests that closely paralleled the regressional approach. Due to a restricted range of 'prestige over interest' scores (m= 2.28, SD= 2.33) and its highly skewed distribution, an alternative hypothesis testing strategy, i.e., nonparametric approach, was necessary to support any significant regressional findings. Unlike parametric tests, nonparametric tests do not require distributional assumptions (Marascuilo & Serlin, 1988). For the main hypothesis, results from regression approach will be explained followed by the nonparametric approach.

The following variables were entered in sequential order in the regression: race (a code of '1' was used for Anglo-American respondents and a code of '0' was used for "Non-White" respondents [i.e., those who identified as African-Americans, Asian-Americans, Hispanic-Americans, Native-Americans, and Other]), gender, and Holland type. To explore whether any interactions among the variables accounted for significant incremental variance on this dependent measure, interaction terms were allowed to enter into the regression equation at the last step.

Results indicated that race (F= 16.58, p< .001) significantly predicted 'prestige over interest' scores, accounting for 5% of the

variation, followed by gender (F= 24.80, p< .001) which accounted for an additional 7% of the variation (See Table 3). For Holland types (I, A, S, and E), the variance explained by all four types was the

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Insert Table 3 about here

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largest among the predictor variables, accounting for additional 12% (F= 14.78, p< .001) above and beyond the variances accounted by race and gender. Among the Holland types, I type respondents (m= 4.16) demonstrated the highest mean score on this measure, followed by E type respondents (m= 2.96), S type respondents (m= 1.96), and A type respondents (m= 1.09). No significant interaction effects were found among race, gender, and Holland types.

To confirm the above findings, the two nonparametric tests used in the study were the Mann-Whitney U test and Kruskall-Wallis test, with the former used for two-samples yielding a U statistic, and the latter used for multiple-samples yielding a Chi-Square statistic. When separate univariate nonparametric tests were performed, main effects were found for race (U= 531.0, p< .0001), gender (U= 6536.0, p< .0001), and Holland type (Chi-Square= 46.46, p< .0001) on the 'prestige over interest' measure. The results should be interpreted with caution because they were simple univariate tests that did not control for possible confounds. Based on the mean ranks of these groups: (a) Non-White respondents significantly preferred more high-prestige/low-interest occupations than did White respondents; (b) males preferred more high-prestige/low-interest occupations than did females; and (c) I type respondents preferred high-prestige/low-interest occupations most, followed by E, S, and A type respondents.

Following the univariate tests, the hierarchically nested testing strategy using the nonparametric tests was then designed to parallel the hierarchical regression procedure. To control for known racial differences, all analyses were first "nested" within race; that is, all analyses were performed separately for White respondents and Non-White respondents. After the respondent groups were separated by race, they were differentiated according to gender within race, yielding the four groups of White males, White females, Non-White males, and Non-White females. This process paralleled the regression method in which gender was entered after race to test whether gender explained additional variance. Following the group differentiation based on race and gender, these groups were then further separated into Holland interest types, each of which yielded four groups of I, A, S, and E types. This step paralleled the regression approach in which Holland types were entered as a third variable in the analysis.

Because of the multiple tests being performed, and the need to control for the inflated risk of committing a Type I error, each of the nonparametric tests was conducted at an alpha level of .01. Mann-Whitney tests yielded a significant between gender group difference for White respondents ($U = 3999.5$, $p < .001$) and for Non-White respondents ($U = 291.0$, $p < .01$), indicating that: (a) White males significantly preferred more high-prestige/low-interest occupations than White females, and (b) Non-White males significantly preferred more high-prestige/low-interest occupations than Non-White females. These findings supported the previous regressional findings with respect to the variance accounted for by gender.

In order to examine differences in Holland interest type within White males, White females, Non-White males, and Non-White females,

Kruskall-Wallis tests were conducted for each of these four groups (see Table 4). Results indicated that there were differences among Holland interest types within both White males (Chi-Square = 13.12,

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Insert Table 4 about here

$p < .01$) and White females (Chi-Square = 42.08, $p < .001$) on their 'prestige over interest' preference scores. On the other hand, there were no differences among Holland interest types for either of the Non-White groups, indicating no score differences between Non-White males and females with regard to their preference for high-prestige/low-interest occupations.

Given the significant Holland type differences for the White male and White female groups, six pair-wise comparison tests among the Holland types were then conducted to locate specific group differences; these comparisons were tested separately within each gender group. Steel's (1960) comparison method was used to test for the possible pair-wise differences. As shown in Table 5, among White males, Wilcoxon Rank Sum W tests yielded significant pair-wise differences for the A and I types ($W = 237.0$, $p < .001$) and the S and

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Insert Table 5 about here

I types ($W = 308.0$, $p < .01$) with respect to their 'prestige over interest' preference scores. Among White females, results indicated significant pair-wise differences between the A and I types ($W = 287.5$, $p < .001$), the S and I types ($W = 1239.0$, $p < .001$), the A and E types ($W = 173.0$, $p < .001$), and the S and E types ($W = 1970.5$, $p <$

.001). These findings suggested that, among White males, I type respondents significantly preferred more high-prestige/low-interest occupations than either A or S types. As for White females, both I and E type respondents significantly preferred more high-prestige/low-interest occupations than did A and S type respondents.

Discussion

Overall, the results from the 'interest congruence' and 'prestige over interest' preference scores in this study indicated that subjects generally preferred interest-congruent occupations. These findings supported Holland's (1973, 1985a) concept of congruence which emphasized that people prefer work environment types that match their personality types. Contrastingly, based on the 'overall prestige' preference scores, only a slight preference for higher prestige occupations was found among the students, irrespective of whether or not these occupations were congruent with their Holland type. It appeared that the college students in this study did not consider prestige to be a prominent factor in their occupational preference.

In another respect, the distinction levels of prestige may have some relevance on the lack of students' preference for higher prestige occupations. As reported in Leung and Plake's (1990) study, when comparing occupations with moderate and high-prestige levels, subjects' preferences for one over the other is rarely evident. This may have been the case in the present study. The instrument employed in this study (OPS) did not include the very low-prestige occupations (e.g., waiter/waitress, custodian) because the subjects were college students. In fact, the majority of "low prestige" occupations in this study were in the moderate prestige range with all of them requiring either some post-high school training or minimal college education.

Therefore, students in the present study may have preferred more interest-oriented occupations simply because the prestige differences were not clear.

Among the main findings, this study showed students with different Holland types to have different importance levels for prestige and interest-congruence when preferring occupations. Overall mean differences in the 'prestige over interest' scores suggested that I type students were most likely to prefer prestige-oriented occupations and A type students were least likely to prefer them. More specific findings from the nonparametric tests revealed that, among Anglo-American students, I type students tended to prefer high-prestige/low-interest occupations than either A or S type students.

Speculations from these findings may be subsumed in the distinctiveness of persons' Holland personality types and also in their subjective definitions of prestige. Among I type students, they may be more oriented toward high prestige occupations because occupations within their type tend to be relatively higher in prestige. Additionally, I type students may prefer occupations with intellectual challenge and complexity that often are high in prestige. It appeared that, for I types, even occupations such as "director of college admission" and "legislator" (high-prestige E types) were preferable to "health technician/worker" and "food production inspector" (lower-prestige I types) because the former occupations were of high prestige and consisted of more complex and intellectual challenges. Therefore, in exploring the concept of prestige, factors of intellectual challenge and complexity of work task may also have played a role in its definition.

As for A and S type students, the prestige level differences did

not appear to impact these subjects in their preference for interest-oriented occupations. Given their respective personality characteristics, perhaps neither A nor S type students may have been as concerned with intellectually challenging work as they were concerned with aesthetic and cooperative work. The finding that S type students maintained their interest-based occupations confirmed Holt's (1989) findings. It suggested that opportunities for S type students to satisfy their helping-oriented interests may be more contained within the S work environment type whereas opportunities for I type students to seek their interests for intellectual complexity may be found in all six Holland work environment types.

On the other hand, A type occupations have been considered to have a wider and more complex prestige range than do I type occupations (Gottfredson, 1981). For example, a popular A type occupation of "painter" can vary its prestige level when it is defined as a "street painter" (low prestige) versus "established painter" (high prestige). Even the occupational title such as "professional painter" is vague in its prestige level if it is not clearly defined in relation to income and education. Therefore, A type students may have viewed low-prestige A type occupations more favorably such that they preferred them over higher prestige counterparts.

Given the observed gender differences in occupational preferences, continued efforts in exploring gender as a primary variable is crucial for career preference research. The finding that males preferred more high-prestige/low-interest occupations suggest that factors of social standing and income still may have greater relevance for males than females (Bigonness, 1988). As for female students preferring more interest-congruent occupations than male

students, this result was consistent with previous findings which suggested that females placed greater importance on interest than prestige when prestige comparison was between moderate and high levels (Leung & Plake, 1990).

Another variable that may be critical of future research on occupational preferences is race/ethnicity. Due to small sample sizes in the individual non-white racial/ethnic groups, this study used the simple method of dichotomizing subjects into Whites and Non-Whites in the regression and nonparametric analyses. Nevertheless, the finding that there were occupational preference differences between Non-White and White students raises the question of whether occupational prestige is perceived differently among specific racial/ethnic groups. Recent studies have reported that, among Asian-American college students, prestige is considered to be very important in their career choice (Leung, 1993; Leong, 1991). Continued research is needed to examine the importance of prestige on different ethnic/racial groups and the impact that this link of occupation and prestige has on people's career choice.

Directions for future career compromise research in relation to prestige and interest largely depend on the preciseness of methodology and instrument construction. Previous researchers (Hesketh, Durant, & Pryor, 1990; Leung & Harmon, 1990; Leung & Plake, 1990) have consistently encountered difficulty empirically distinguishing prestige and interest dimensions of occupations due to their interrelatedness. Up to this point, methodologies using free-choice and/or forced-choice formats have been instrumental for career compromise research (Hesketh, Elmslie, & Kaldor, 1990; Holt, 1989; Leung & Plake, 1990). Based on the forced-choice procedure used in

this study, the following specific suggestions can be made to improve future methodology: (a) either administering subjects a sex-role instrument (e.g., Bem Sex Role Inventory [1978]) to better control sex-role differences among subjects or controlling for gender-type of occupations in the OPS, (b) clearly defining the concept of prestige prior to test administration, and (c) revamping occupational titles in the OPS so that more diversity be represented in their titles, particularly for high-prestige R type and low-prestige I type occupations. Although OPS's initial validity and reliability information have been collected for the purpose of this study, further refinement of the instrument is obviously needed to conduct a more empirically-sound career preference study.

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Table 1

TSEI Prestige Score Ranges of Holland Work Environment Types

Holland Work Environment Type	TSEI* Ranges	
	Low Prestige	High Prestige
Realistic(R)	29.02 to 50.11	67.55 to 82.32
Investigative(I)	23.82 to 50.04	77.32 to 89.57
Artistic(A)	30.62 to 54.42	55.67 to 79.72
Social(S)	20.51 to 51.64	59.94 to 86.20
Enterprising(E)	25.38 to 50.01	54.35 to 88.42
Conventional(C)	23.97 to 41.79	61.62 to 70.00

* TSEI: Total Socioeconomic Index (Stevens and Cho, 1985).

Table 2

The OPS Forced-Choice Format

	Occupation 1		Occupation 2	
Pair#	Holland Type	Prestige	Holland Type	Prestige
1.	I	High	E	Low
i.e.	[physician]		[manufacturing sales representative]	
2.	S	High	R	Low
i.e.	[college professor in education]		[mechanical engineering technician]	
3.	A	High	C	Low
i.e.	[landscape architect]		[general-ledger bookkeeper]	
4.	R	High	S	Low
i.e.	[mining engineer]		[welfare service aid]	
5.	E	High	A	Low
i.e.	[certified public accountant]		[theatrical set designer]	
6.	E	High	I	Low
i.e.	[public relations manager]		[biological technician]	

Set (Pair) 1 represents the OPS "conflicted" pair. In this particular pair, "physician" is of a Investigative work environment type with higher prestige level than "manufacturing sales representative". Manufacturing sales representative, on the other hand, is of a Enterprising work environment type (an opposite type of I type) with a lower prestige level than the physician. Therefore, a person with E Holland type would have an occupational preference conflict when faced with Set 1 since physician is of higher prestige but lower in interest whereas manufacturing sales representative is of higher interest but lower in prestige.

Table 3

Hierarchical Multiple Regression: Predicting 'Prestige over Interest' Scores from Gender and Holland Type

Predictor	R	R^2 change	F change	r	B
Race[1]	.23	.05	16.58**	.23	.21
Gender	.36	.07	24.80**	.27	.25
Holland Type[2]:	.49	.12	14.78**		
A vs. I				-.21	-.46
E vs. I				.13	-.18
S vs. I				-.15	-.37

Note. N = 294.

[1] In the regression analysis, race was entered first as a covariate.

[2] Holland type, because it is an unordered qualitative variable with four types (I, A, S, & E), was entered as a set of three dummy codes comparing A, S, and E types to I type.

** $p < .001$.

Table 4

Four Kruskall-Wallis Tests of 'Prestige over Interest' Preference Scores Nested by Race, Gender, and Holland Interest Type

No.	Groups	Mean Rank	n	Chi-Square
	White Male:			13.12*
1.	Investigative(I)	56.41	11	
2.	Artistic(A)	26.33	18	
3.	Social(S)	38.53	29	
4.	Enterprising(E)	39.67	18	
	White Female:			42.08**
5.	I	125.85	13	
6.	A	48.13	16	
7.	S	66.99	100	
8.	E	107.77	22	
	Non-White Male:			2.18
9.	I	9.21	7	
10.	A	7.75	2	
11.	S	13.29	7	
12.	E	11.60	5	
	Non-White Female:			5.32
13.	I	26.67	6	
14.	A	13.88	8	
15.	S	25.67	27	
16.	E	23.40	5	

Note. N = 294.

* $p < .01$.

** $p < .001$.

Table 5

Pair-Wise Wilcoxon Rank Sum W Tests of 'Prestige over Interest' Scores by Holland Types Among White Males and Females

No.	Paired Groups	Z	W
	White Male:		
1.	A & S Types	-2.08	339.0
2.	A & E Types	-1.75	279.0
3.	A & I Types	-3.28	237.0**
4.	S & E Types	- .21	441.5
5.	S & I Types	-2.53	308.0*
6.	E & I Types	-1.93	207.5
	White Female:		
7.	A & S Types	-1.83	721.5
8.	A & E Types	-4.25	173.0**
9.	A & I Types	-4.19	287.5**
10.	S & E Types	-4.27	1970.5**
11.	S & I Types	-4.66	1239.0**
12.	E & I Types	-2.02	291.5

* $p < .01$.

** $p < .001$.